

ABSTRACT

Charles University in Prague, Faculty of Pharmacy in Hradec Králové

Department of Inorganic and Organic Chemistry

Candidate **Mgr. Jiří Kratochvíl**

Supervisor **prof. RNDr. Milan Pour, Ph.D.**

Title of Doctoral Thesis **Synthesis of Specifically Substituted Heterocycles via Catalytic Reactions**

This Ph.D. thesis deals with the synthesis of γ -alkylidene- α,β -unsaturated δ -lactones and lactams. Migita-Stille cross-coupling served as the key step in their preparation. Catalysis with palladium black was applied to the synthesis of the lactones and we demonstrated that it doesn't act as heterogeneous catalyst. Instead, it's only a precursor for catalytically active species, which is generated in situ and its true nature is unknown. The palladium nanoparticles are most likely responsible for the catalysis, although involvement of complexed atomic palladium cannot be excluded. Palladium black catalysis was also successfully applied to the synthesis of a series of structurally different substrates, which demonstrates its versatility and it was also proved that the catalyst can be easily recycled by simple filtration. An unusual Tsuji-Trost reaction then enabled transfer of the alkylidene substituent of the lactones to C5 furnishing polysubstituted heterocycles.